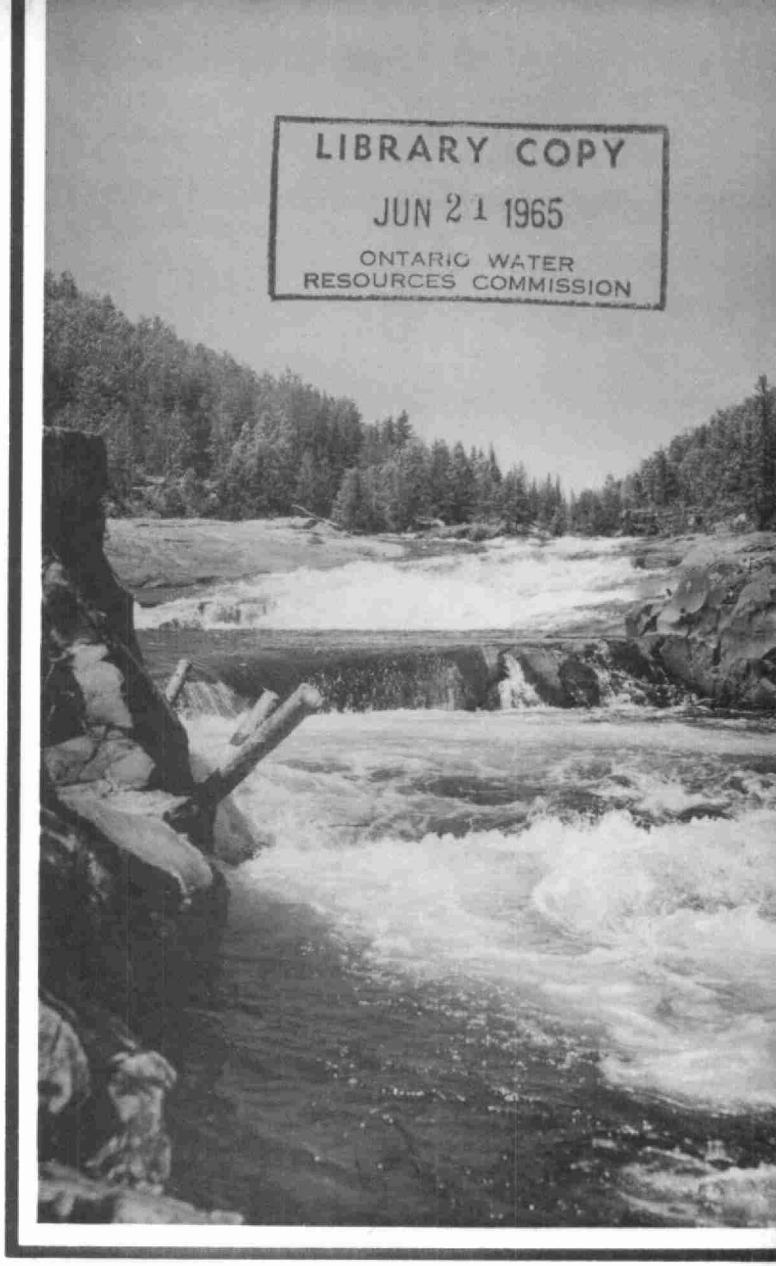
North Bay Water Pollution Control Plant



1963 Annual Report

Ontario Water Resources Commission

ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of North Bay

Local Advisory Committee.

Gentlemen:

I am pleased to submit, for your information, the 1963 Annual Operating Report of the North Bay Water Pollution Control Plant, OWRC Project No. 58-S-10, which has been prepared by our Division of Plant Operations.

We are grateful for the kind cooperation which you and your staff have extended to our Operations staff throughout the year. We look forward to a continuing close association with you in our mutual endeavour to control pollution.

Yours very truly,

D. S. Caverly, P. Eng.,

General Manager

General Manager,
Ontario Water Resources Commission.

Dear Sir:

It is with pleasure that I present to you the Annual Report of the operation of the North Bay Water Pollution Control Plant, OWRC Project No. 58-S-10 for 1963.

This report presents design data, outlines operating problems encountered and summarizes in tables, charts and graphs all significant flow and cost data.

Yours very truly,

B. C. Palmer,
Director,
Division of Plant Operations

foreword

This report is designed to present the highlights of the operation of these works during 1963. Trends in flows and other operating data can be extremely useful in the development of necessary long range enlargement and improvement programs.

In addition to the activities reported herein, much unrecorded effort has contributed to the success of this operation. The municipalities, through representatives on the Local Advisory Committee, have given valuable assistance in reviewing salary schedules, detailed operating budgets, personnel problems, flow patterns, and major maintenance problems.

The Division of Plant Operations has provided direction to the field staff in administrative procedures, quality control, maintenance schedules, equipment inspection and purchase supervision. A number of other Divisions of the Commission have been of service. The Division of Construction has offered helpful advice on equipment selection and renovation problems. The Division of Sanitary Engineering has maintained, through its District Engineering staff, a keen interest in the operation and has made a number of constructive recommendations. Its operator training courses have been very helpful. The Division of Finance has processed many payrolls, purchase orders and invoices dealing directly with this project. The Commission Personnel Director has been most helpful in the selection of new staff.

The excellent cooperation of all of these groups is gratefully acknowledged.

B. C. Palmer,
Director,
Division of Plant Operations

DIVISION OF PLANT OPERATIONS

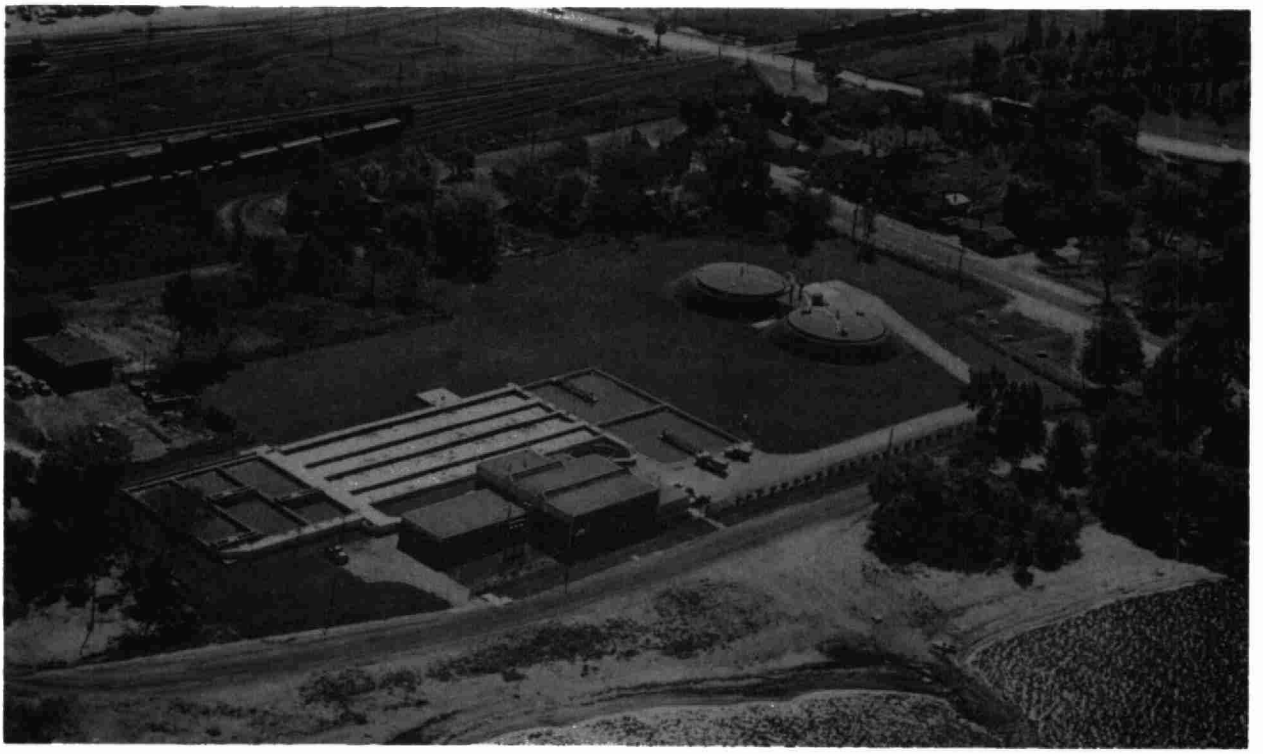
contents

Mr. C. W. Perry
Assistant Director

Mr. D. A. McTavish
Regional Supervisor

Mr. M. B. Fielding
Operations Engineer

NORTH BAY WATER POLLUTION CONTROL PLANT



OPERATED FOR

THE CITY OF NORTH BAY

BY

THE ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN

A. M. Snider

COMMISSIONERS

W. D. Conklin, Q. C.
J. H. H. Root, M. P. P.
Dr. J. A. Vance, LL. D., P. Eng.
A. A. Wishart, Q. C., M. P. P.

GENERAL MANAGER

D. S. Caverly

ASSISTANT GENERAL MANAGERS

G. M. Galimbert
L. E. Owers

COMMISSION SECRETARY

W. S. MacDonnell

1956 to 1963 History

INCEPTION

In 1956, the City of North Bay approached the Ontario Water Resources Commission to finance, construct and operate sewage treatment facilities in the municipality. After preliminary discussions were held, it was decided that a joint scheme, including the Townships of West Ferris and Widdifield would most adequately serve the needs of the area. The consulting engineering firm of Graham Reid and Associates Limited was engaged to prepare plans and specifications.

APPROVAL

At a public hearing on September 26th, 1958, the Ontario Municipal Board approved the integrated sewage works scheme.

CONSTRUCTION

The project, consisting of trunk sewers, manholes, appurtenances and an activated sludge sewage treatment plant, was divided into four contracts.

Stirling Construction was awarded the contract for the treatment plant. Beaver Construction and Midwestern Construction shared in the rest of the project.

Construction was substantially completed in the fall of 1960 and the sewage treatment plant was put into operation at that time.

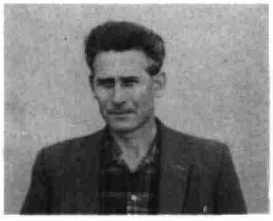
Since the original project 58-S-10 was completed, an additional trunk sewer and metering pit was constructed for the Township of Widdifield as project No. 62-S-103. This feeds into the North Bay treatment plant.

TOTAL COST

The tentative total cost of the combined project was:

	$ 2,366,089.66	58-S-10
	$ 226,696.86	62-S-103
TOTAL	$ 2,592,786.52	

Project Staff



Mr. Stan Healey,
Superintendent

Mechanic Operator	Operators
W. Sutherland	R. Lepage
	G. Gerbasi
Electrician Operator	G. Smith
	G. Sevigney
A. Gauthier	

COMMENTS

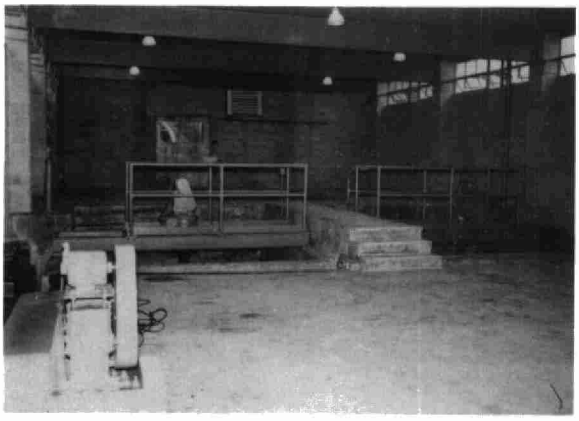
The plant is staffed by a Superintendent and six operators. Two of the operators are responsible for the electrical and mechanical maintenance with the remaining four operators being on shift. Until December 1st, 1962, there were three shifts per day providing the plant with 24 hour supervision daily. However, the increasing workload during the year necessitated either an addition to the staff or a decrease in the hours of supervision. A study of the problem indicated that the installation of an alarm system would allow a decrease in supervision from 24 to 16 hours. Trouble sensing devices were installed at all critical points and were connected to a central alarm located in the City Police Department. Upon activation of the alarm during the non-supervised period, midnight until 8:00 A. M., the officer on duty will call a member of the plant staff who will be able to rectify the problem.

At a Local Advisory Committee meeting held in April, it was decided that for security reasons a night watchman would be hired for the midnight to eight in the morning shift during the summer months.

Operators are required to do all grounds and building maintenance as well as ensure a high quality of plant effluent.

The operation of the project is supervised by the Division of Plant Operations through an Operations Engineer who makes periodic inspection visits. The services of the Electronics and Maintenance Sections of the Division are available to the Operations Engineer and they assist him and the staff in rectifying plant problems. The Maintenance Section made a complete mechanical and electrical inspection of the plant and pumping station and found everything in good order. In January, the Electronics Section inspected the plant and found it in good order. All of these services, as well as other OWRC head office services, are at no charge to the municipality.

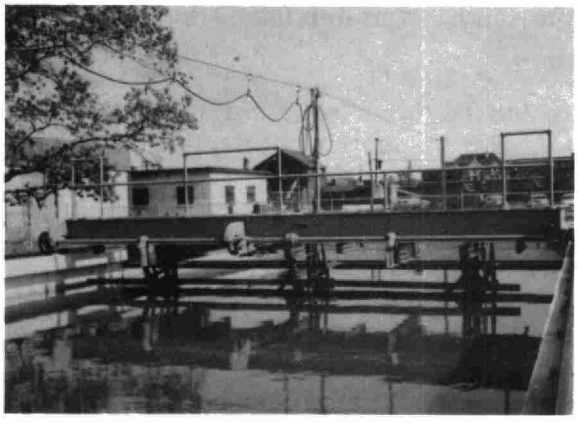
Description of Project



INFLUENT WORKS

From the influent manhole, the sewage flows into the influent works where the first degree of treatment is given. Grit is removed in two square parallel chambers where the velocity of the sewage is reduced to a point whereby grit and sand will settle out but most organic solids will not. The chambers are equipped with mechanical scrapers which gather the grit into the collector channels located beside the grit chambers. The collector channels are equipped with inclined rectangular dragout conveyors which discharge the grit into 45 gallon drums for removal.

Prior to entering the main plant wet well the sewage passes through two parallel Griductors which screen and cut organic solids and rags. In the event that the Griductors must be taken out of service, the plant is equipped with a bypass channel and coarse bar screen.



PRIMARY TREATMENT

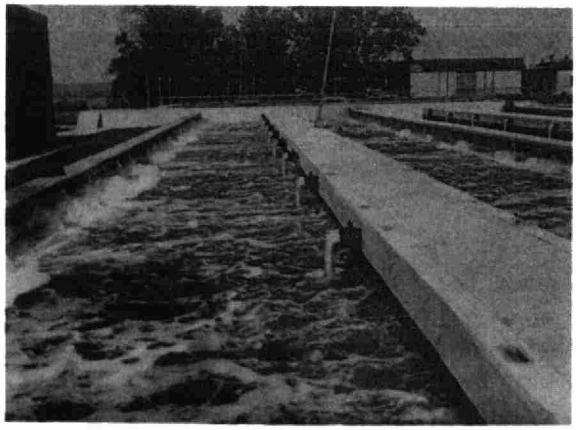
From the wet well, the raw sewage is pumped into three primary sedimentation tanks where the sewage is held long enough to allow organic solids to settle out and form a sludge. This raw sludge is collected by means of travelling scrapers which are mounted on carriages that travel back and forth on rails running the length of the tanks. On the forward pass, the scrapers push raw sludge to hoppers on the bottom at one end of the tank from which it is drawn off at regular intervals. On the return pass, scum or grease is skimmed from the surface and deposited in scum aprons at the opposite end of the tank to the sludge hoppers. Both raw sludge and scum are pumped to the primary digester. The partially treated sewage then flows over the weirs to the aeration section.

RAW SLUDGE THICKENING PIT

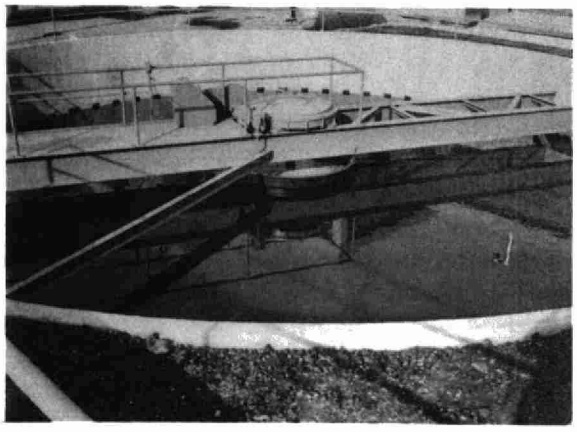
The raw sludge from the primary sedimentation tanks can be pumped to a thickening pit where excess water can be removed before pumping it to the digester. Due to odour problems with this tank, it has been taken out of service.

AERATION

Sewage from the primary sedimentation tanks flows by gravity to four single pass aeration tanks where it is mixed with activated sludge that has been returned from the final sedimentation tanks.



Air is injected into the tank through air diffusers near the tank bottom. Two blowers powered by gas engines provide this air, based on design flow, at a rate of 1.35 cubic feet per gallon of sewage. The biological floc produced in the aeration section requires food and oxygen. The sewage is the food source and the air is the oxygen source. Continual control is maintained on the aeration section by means of a routine sampling procedure. From the test results, the variables are adjusted to establish optimum conditions in this section.

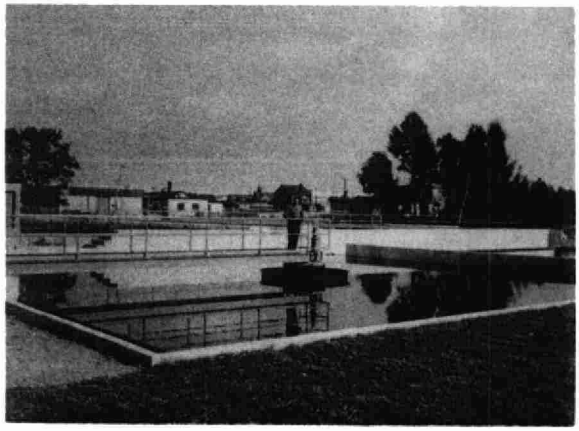


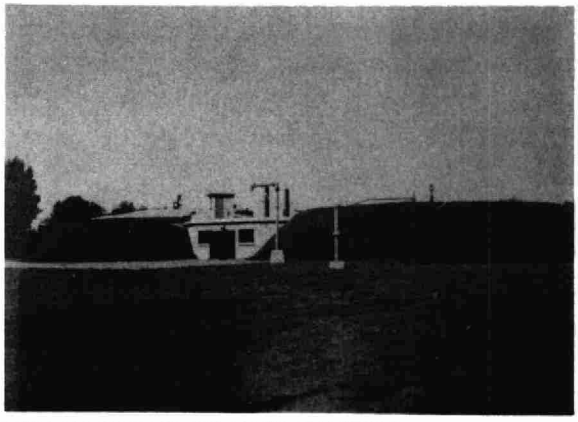
FINAL SEDIMENTATION TANKS

The aerated mixed liquor from the aeration section is directed to two square final sedimentation tanks. There the floc is allowed to settle to the bottom and be collected by means of submerged rotary collectors. Some of the sludge is returned to the aeration section where it is instrumental in the activated sludge process. The rest is wasted to the primary sedimentation tank where it is removed with the raw sludge.

CHLORINE CONTACT CHAMBERS

The effluent from the final sedimentation tanks is chlorinated during the summer months as required by the Division of Sanitary Engineering of the OWRC. The final effluent is then discharged to Lake Nipissing, 1,000 feet from shore.





SLUDGE DIGESTION TANKS

The raw and waste activated sludges are pumped to the primary digester where they are mixed and maintained at about 90° Fahrenheit. The sludge digestion in this plant is of the anaerobic alkaline process. It is in the primary digester that the greatest proportion of sludge stabilization is achieved. The sludge passes through the acid stage to the methane gas producing stage in which vast amounts of combustible methane gas are produced. This gas is used to heat the digesters and also as fuel for the gas engines which drive the blowers.

Sludge is transferred from the primary digester to the secondary digester where concentration of the solids is effected. The solids are pumped from the bottom of the secondary digester to a waiting tank truck for disposal. Supernatant is returned from the secondary digester to the primary sedimentation tanks.

Design–Data

GENERAL

Type of Plant - Activated sludge process.

Design Population - 50,000 persons.

Design Plant Flow - 4.0 MGD.

Per Capita Flow - 80 Imperial gallons per day.

Five Day BOD -

Raw Sewage	-	150 PPM
Removal	-	85 %

PRIMARY TREATMENT

Grit Removal

Size - 2 parallel 11.5' x 11.5' x 2.0' liquid depth tanks.

Volume - 3,300 gallons.

Retention - 1.2 minutes.

Velocity - .163 fps.

Type of Unit - Walker type CRG grit collector with dragout and organic return pump.

Screening

Two Griductor Comminutors to cut sewage.

Bar screen on bypass channel.

Sewage Lift Pumps

Two - 4 MGD gas powered units.

One - 4 MGD electric powered unit.

Primary Sedimentation Tanks

Size - 90' x 30' x 10' depth, three units.

Volume - 505,000 gallons total.

Retention - 3 hours.

Surface Settling Rate - 500 gallons per sq. ft. of tank per day.

Weir Rate - 44,000 gallons per lineal ft. per day.

Hardinge Clarifier Mechanisms - for sludge and grease collection.

SECONDARY TREATMENT

Aeration Section

Size - 4 single pass tanks, 185' x 20' x 12' liquid depth.

Total volume - 1.1 MG.

Retention - 5.31 hours at 1.25 x design flow.

Air Supply - 1.35 cu. ft. per gallon.

- diffused air.

Five Day BOD Loading - 4,200 pounds per day total.

Final Sedimentation Tanks

Size - 2 units, 60' x 60' x 11' liquid depth.

Volume - 500,000 gallons.

Retention - 3 hours.

Surface Settling Rate - 550 gallons per sq. ft. per day.

Weir Rate - 8,000 gallons per lineal ft. per day.

Sludge collectors are Walker Type RSX circular.

Chlorine Contact Chamber

Size - 1 circular unit, 34 ft. diameter x 12.5 ft. depth.

Volume - 71,000 gallons.

Retention - 25 minutes.

Chlorinator - 500 lbs. scale. BIF semi-automatic.

Outfall

Size - 1,000 ft. of 36 inch diameter steel pipe.

Retention - 16 minutes.

Digestion System

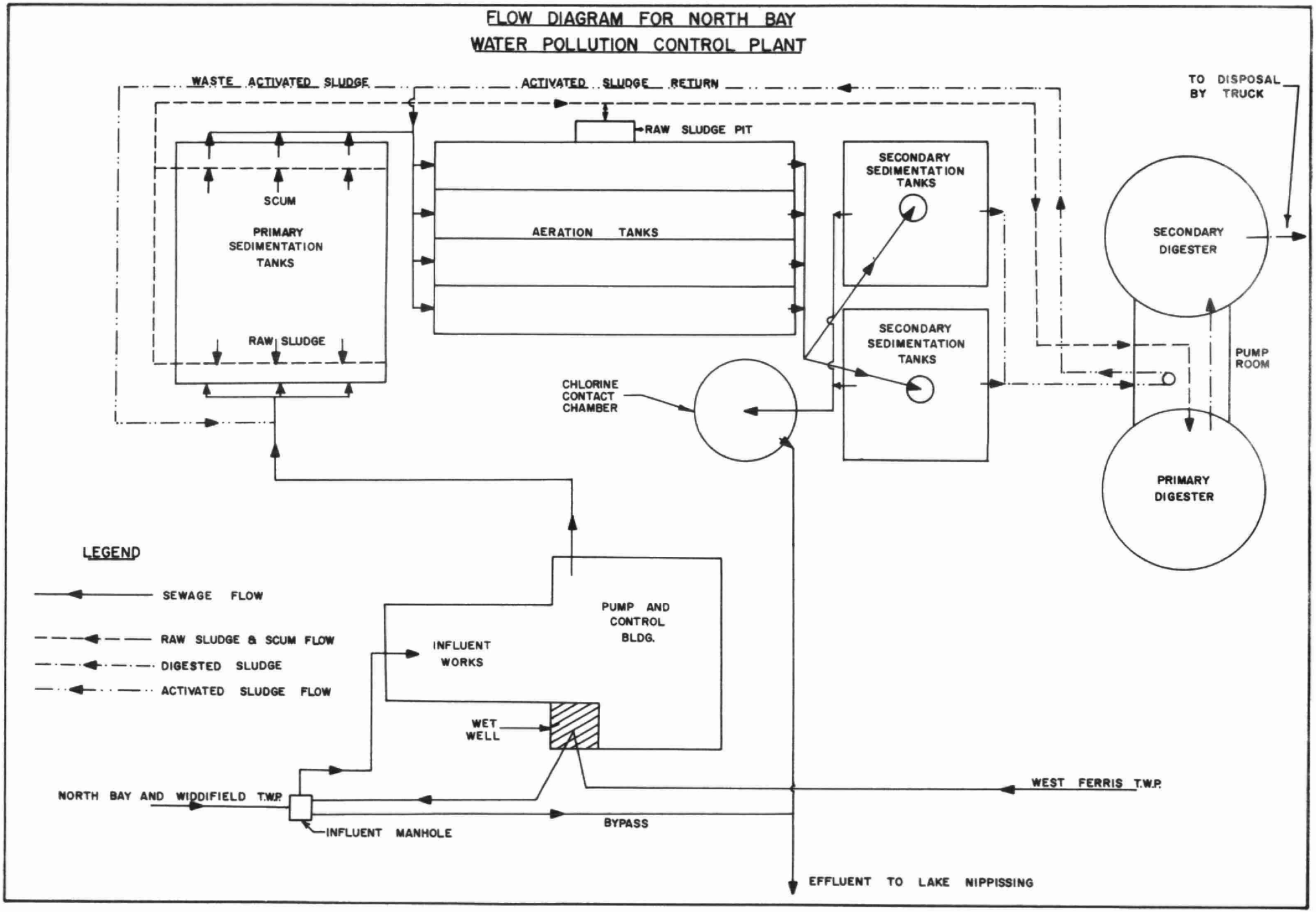
Digesters - 2 units, one with floating cover, 65 ft. diameter each.

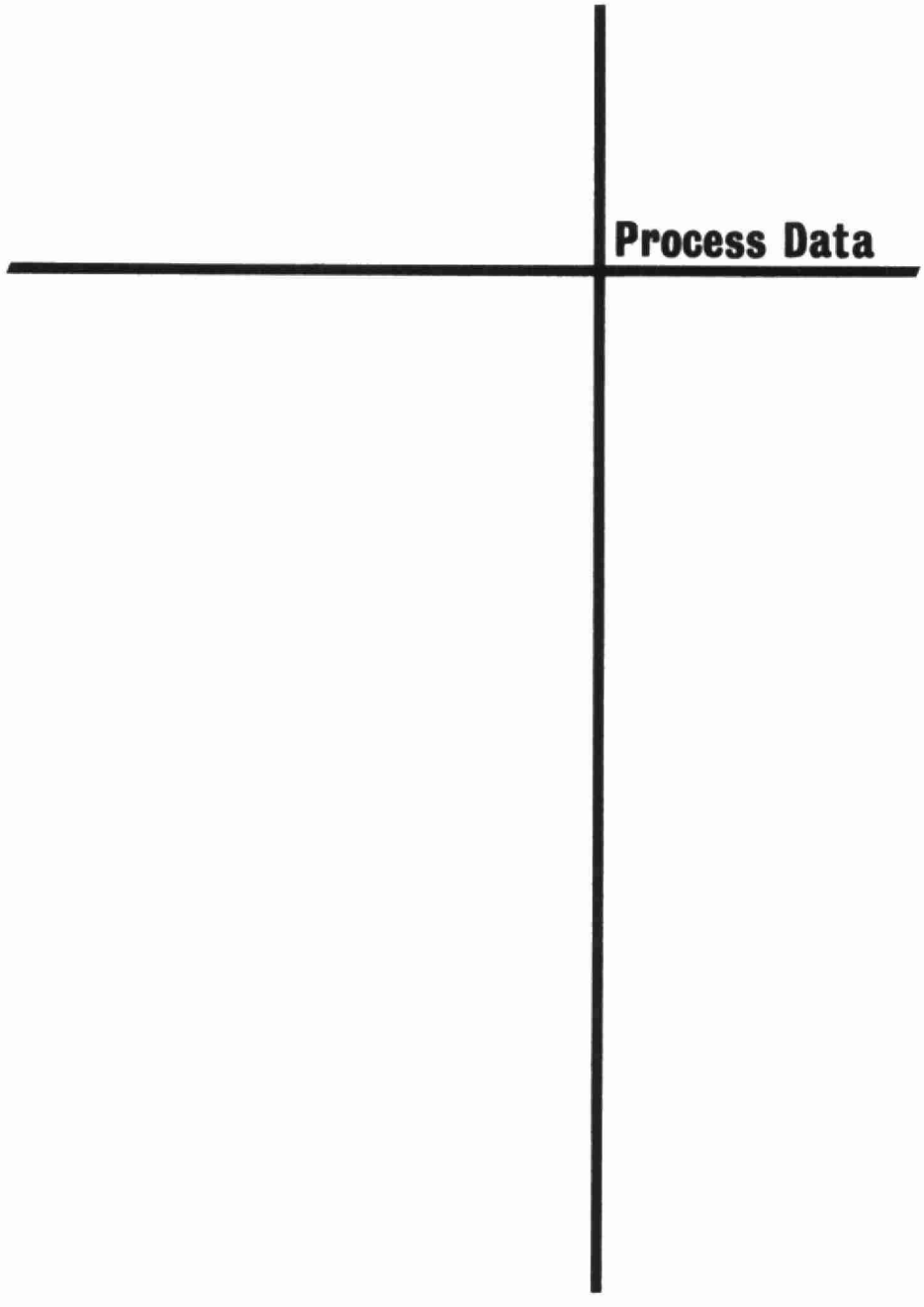
Volume - Primary - 70,000 cu. ft.
- Secondary - 74,000 cu. ft.

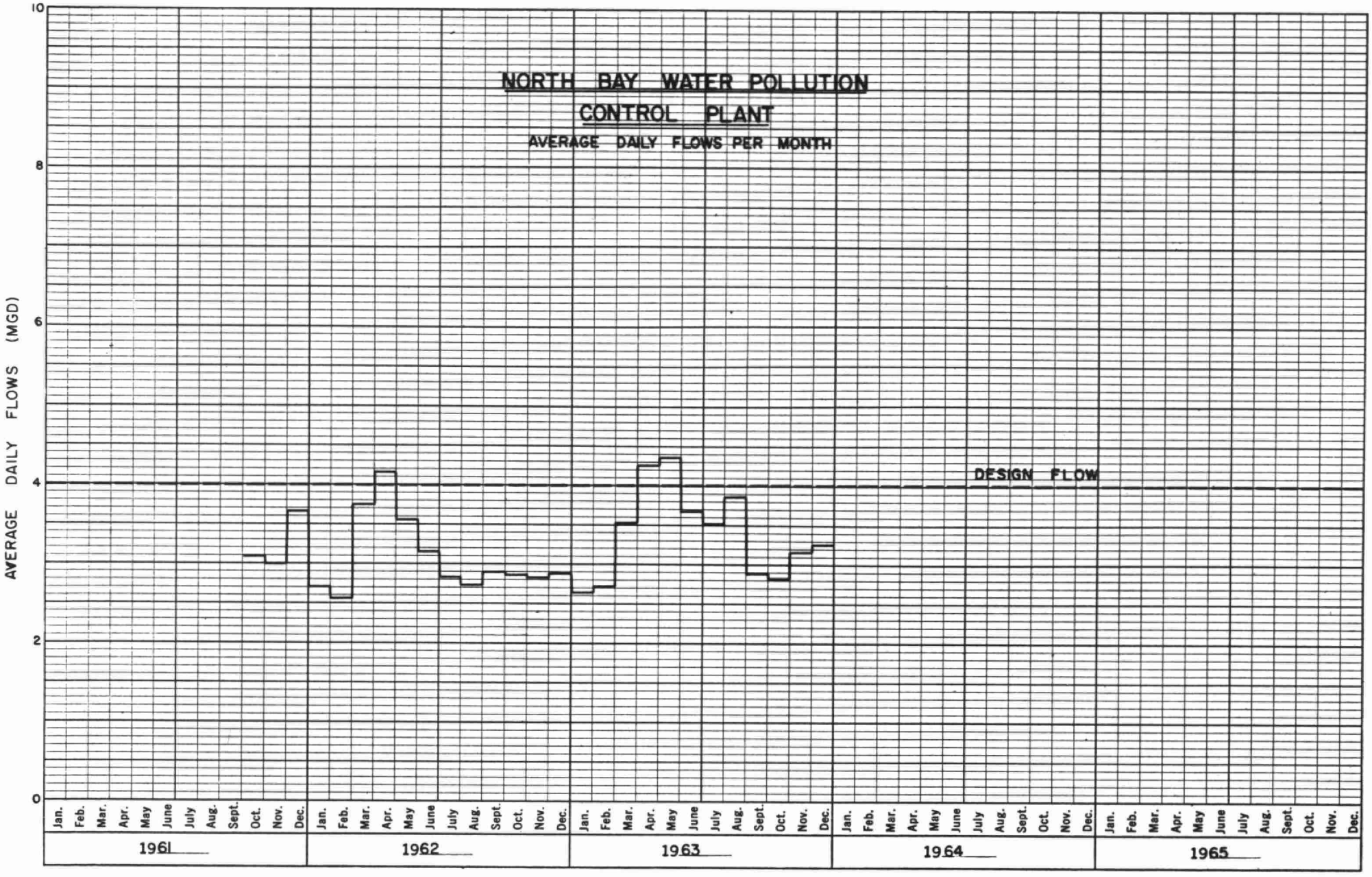
Per Capita Loading - 2.9 cu. ft. per capita.

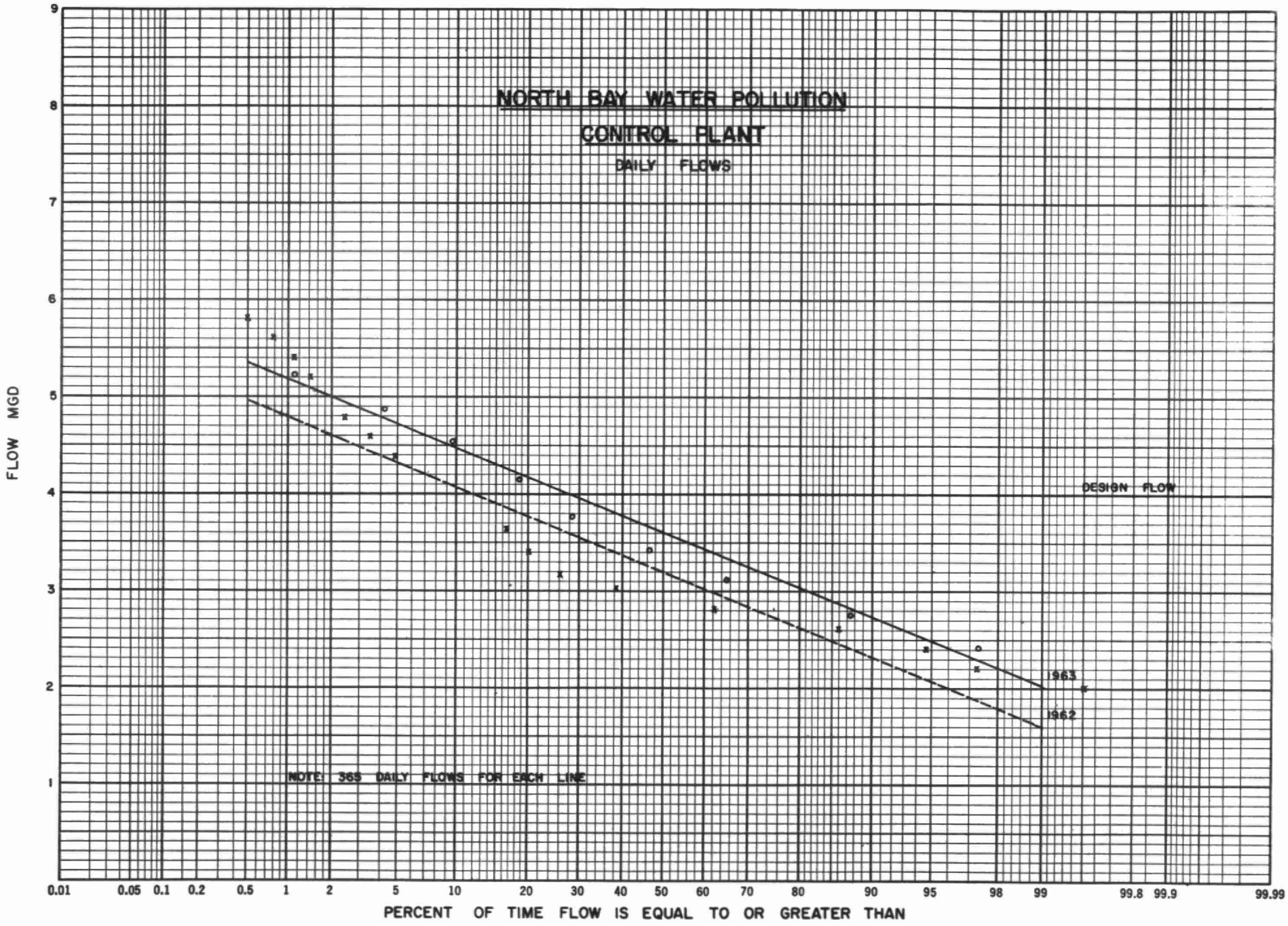
Mixing - 3 Dorr 5 HP draft tube mixers.

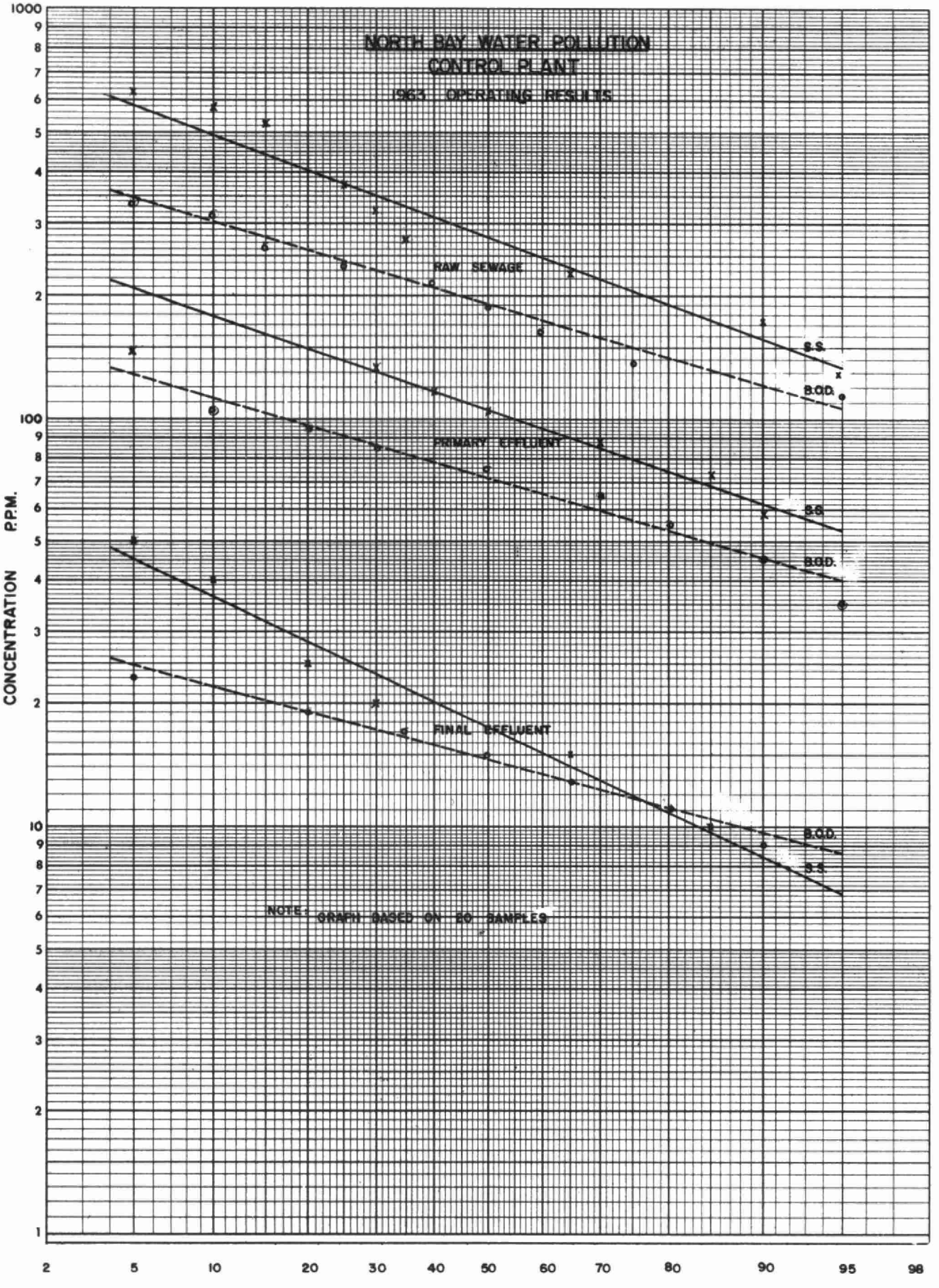
FLOW DIAGRAM FOR NORTH BAY WATER POLLUTION CONTROL PLANT

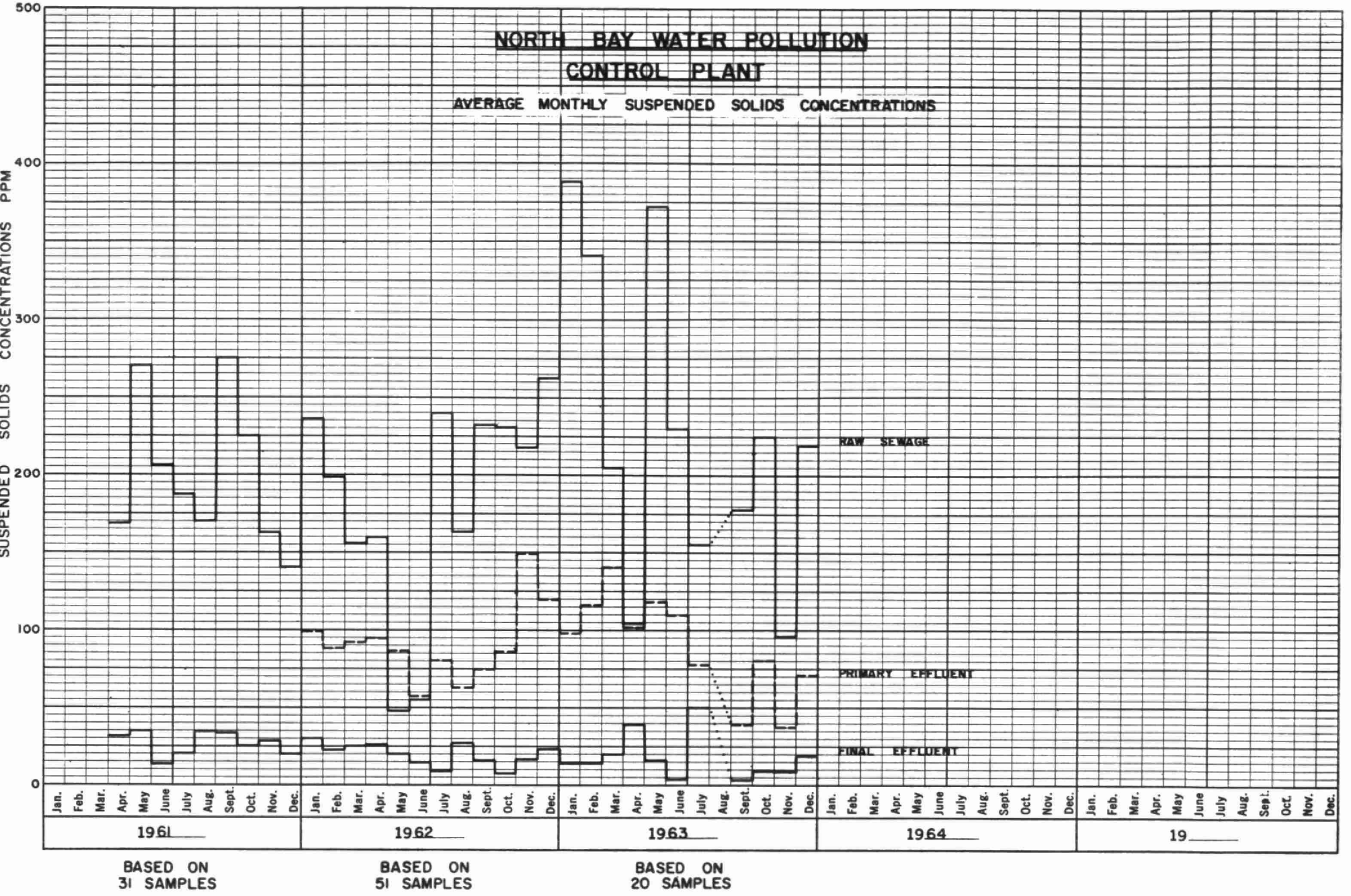


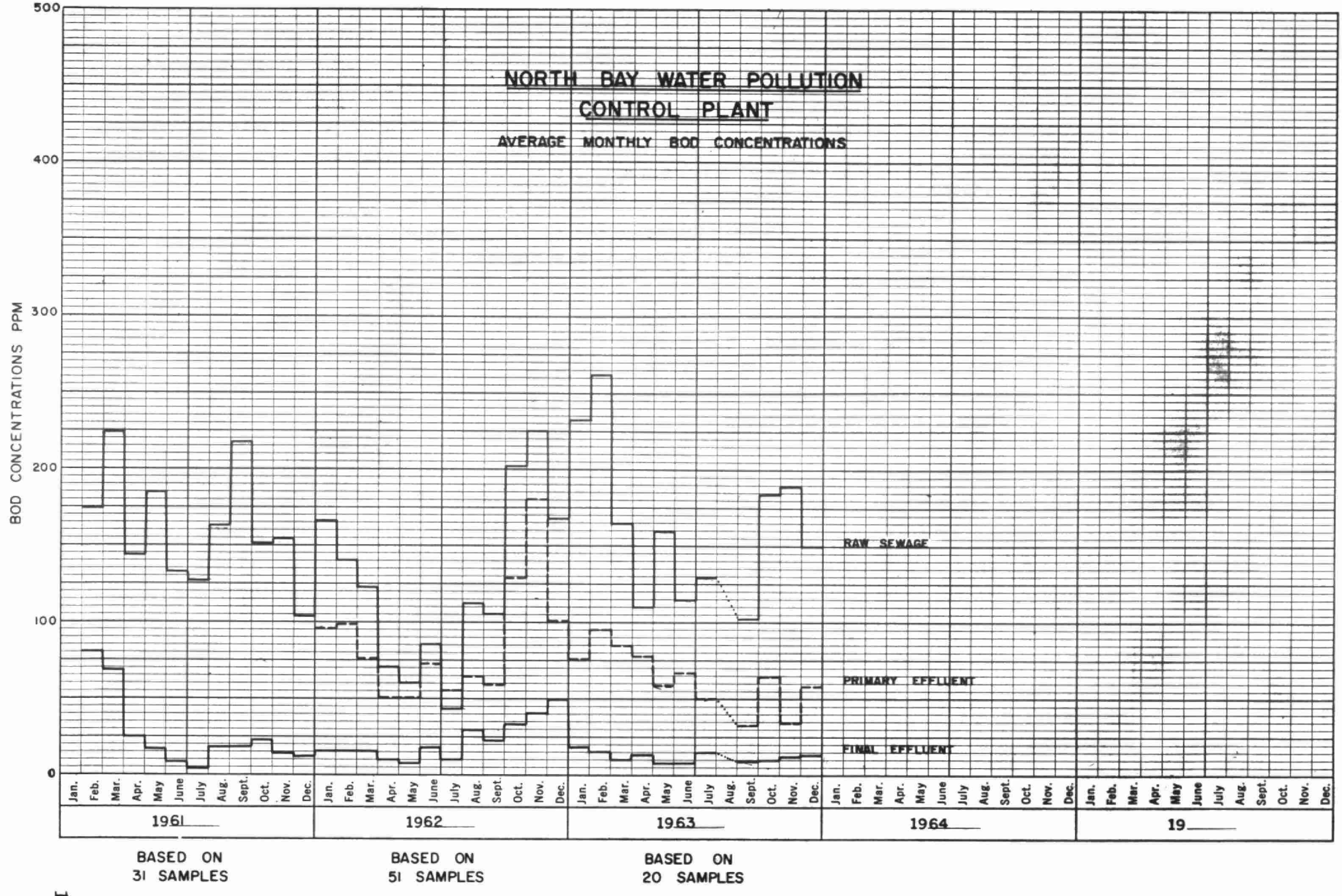

Process Data


NORTH BAY WATER POLLUTION
CONTROL PLANT
AVERAGE DAILY FLOWS PER MONTH
AVERAGE DAILY FLOWS (MGD)
10
8
6
4
2
0
DESIGN FLOW
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1961
1962
1963
1964
1965


NORTH BAY WATER POLLUTION
CONTROL PLANT
DAILY FLOWS
FLOW MGD
DESIGN FLOW
1963
1962
NOTE: 365 DAILY FLOWS FOR EACH LINE
PERCENT OF TIME FLOW IS EQUAL TO OR GREATER THAN
9
8
7
6
5
4
3
2
1
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99


NORTH BAY WATER POLLUTION CONTROL PLANT
1963 OPERATING RESULTS
RAW SEWAGE
S.S.
B.O.D.
PRIMARY EFFLUENT
S.S.
B.O.D.
FINAL EFFLUENT
B.O.D.
S.S.
NOTE: GRAPH BASED ON 50 SAMPLES
CONCENTRATION P.P.M.
1000
100
10
1
2
5
10
20
30
40
50
60
70
80
90
95
98
PERCENT OF SAMPLES EQUAL TO OR GREATER THAN


NORTH BAY WATER POLLUTION
CONTROL PLANT
AVERAGE MONTHLY SUSPENDED SOLIDS CONCENTRATIONS
SUSPENDED SOLIDS CONCENTRATIONS PPM
500
400
300
200
100
0
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1961
1962
1963
1964
19
BASED ON 31 SAMPLES
BASED ON 51 SAMPLES
BASED ON 20 SAMPLES


NORTH BAY WATER POLLUTION CONTROL PLANT
AVERAGE MONTHLY BOD CONCENTRATIONS
BOD CONCENTRATIONS PPM
500
400
300
200
100
0
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1961
1962
1963
1964
19
BASED ON 31 SAMPLES
BASED ON 51 SAMPLES
BASED ON 20 SAMPLES

GRIT, B.O.D AND S.S. REMOVAL

MONTH	B.O.D.				S.S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JANUARY	234	19	92.0	87.52	388	15	96.0	151.84	1030
FEB.	263	16	94.0	93.87	342	15	95.5	124.28	864
MARCH	165	12	92.5	83.64	205	20	90.0	101.14	881
APRIL	112	14	87.5	62.18	105	40	62.0	41.24	313
MAY	160	9	94.5	101.48	373	17	95.5	239.27	760
JUNE	115	9	92.0	58.20	231	4	98.0	124.41	555
JULY	130	17	87.0	61.32	156	51	67.5	56.98	834
AUGUST				74.22				104.67	520
SEPT.	103	10	90.0	40.22	178	4	97.5	75.26	907
OCTOBER	185	11	94.0	75.74	226	9	96.0	94.46	807
NOV.	190	13	93.0	83.63	97	10	89.5	41.10	902
DEC.	150	14	90.5	68.62	220	19	91.5	101.42	725
TOTAL				896.64				1256.07	9098
AVERAGE	164	13.1	91.5	74.22	229	18.5	89.0	104.67	758

PPM - Parts Per Million
BOD - Biological Oxygen Demand
S.S. - Suspended Solids

COMMENTS

No sewage analysis was made during August. In order to arrive at a total tons of BOD and S.S. removed, average values were inserted for this month.

The percentage reductions of BOD and S.S. concentrations have increased over the 1962 values of 82% and 86.5% respectively. The average concentrations of BOD and S.S. in the raw sewage have increased from 126 PPM and 184 PPM respectively. The effluent quality improved with the average concentrations of BOD and S.S. dropping from 23.5 PPM and 20 PPM respectively.

During the year, the grit removal was 7.37 cubic feet per million gallons compared with 9.1 cubic feet per million gallons in 1962.

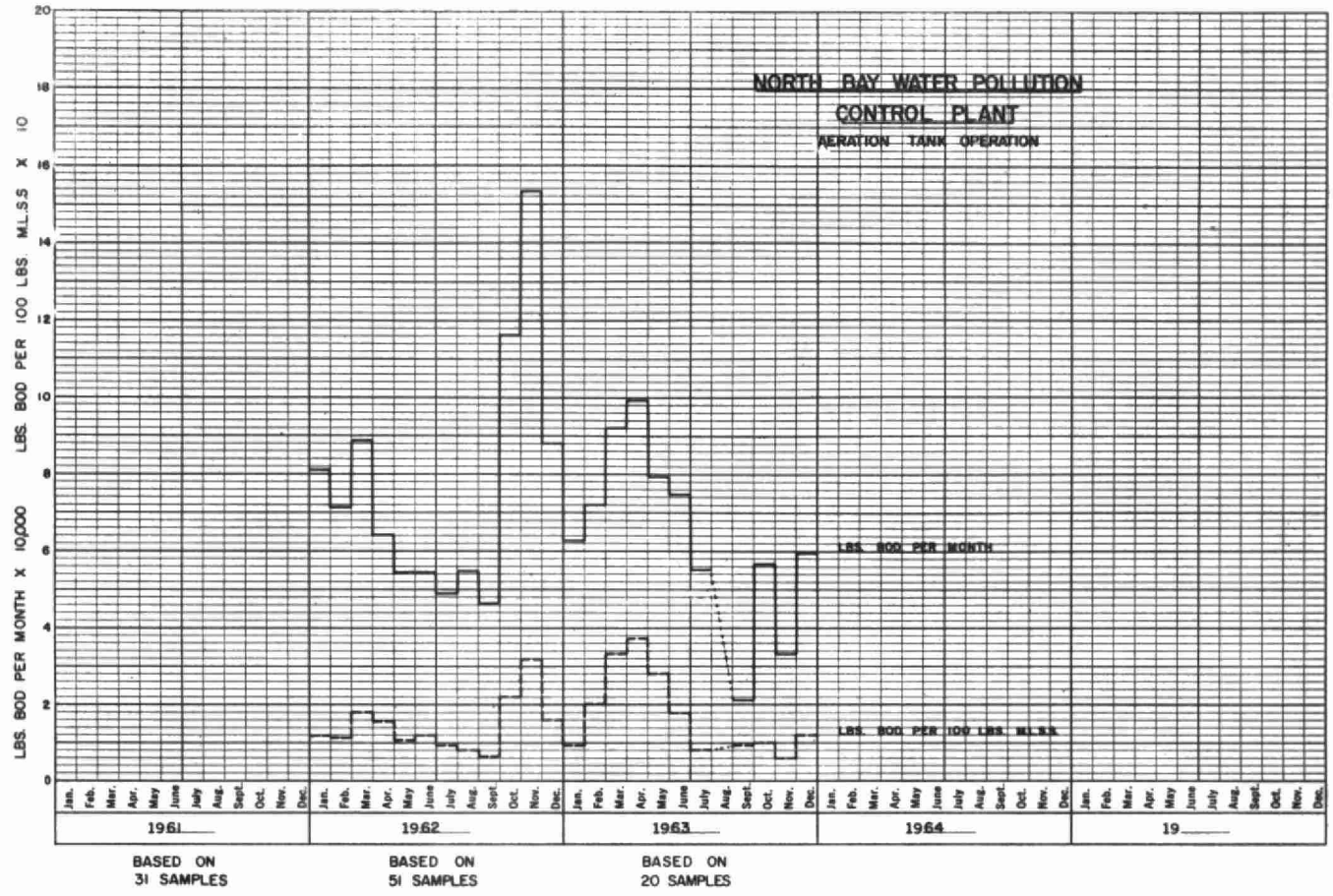
Each operator has spent time in the plant's laboratory and, when operating on the day shift, is required to do the following tests:

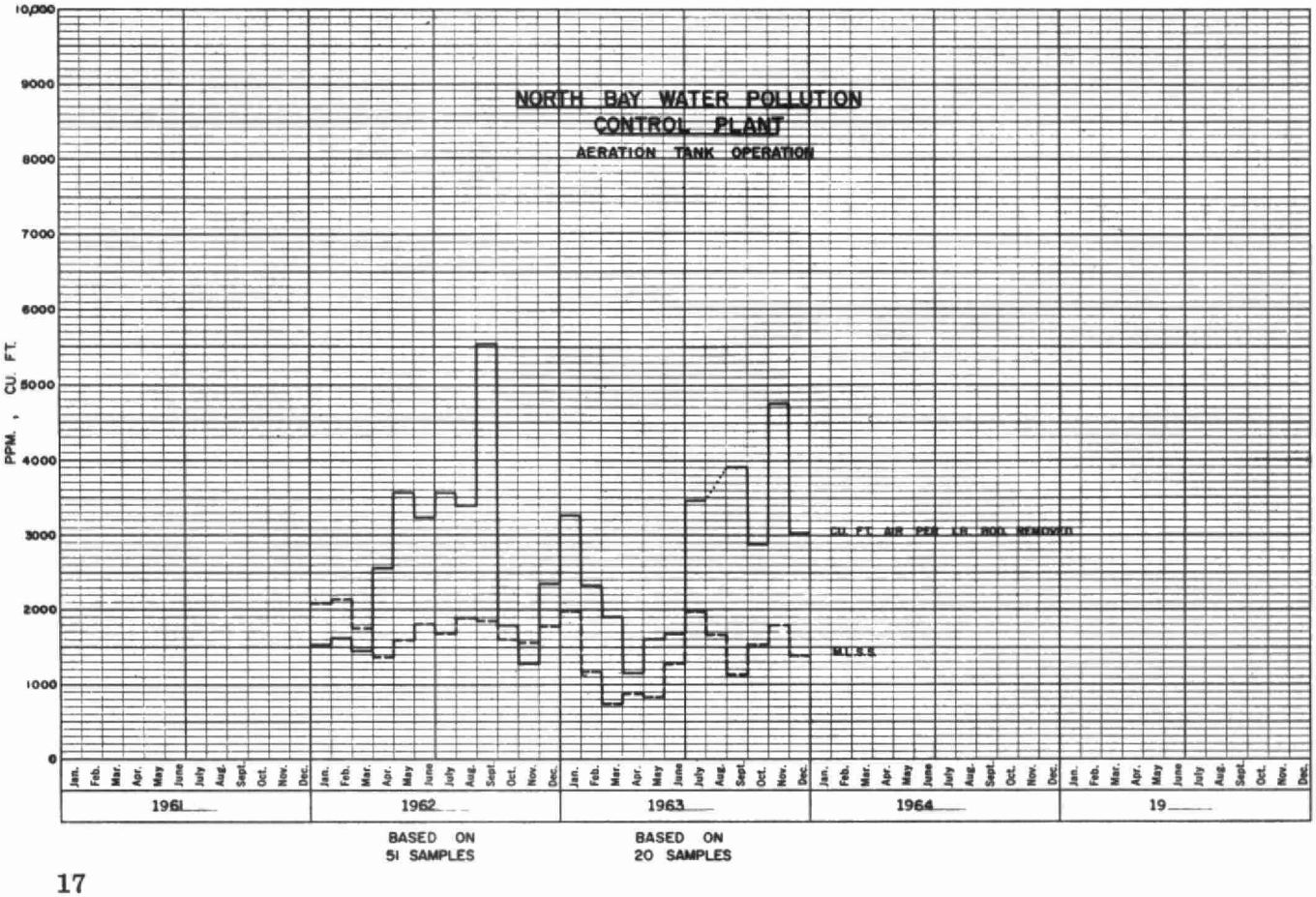
1)	Settleable Solids	Raw Sewage
2)	Dissolved Oxygen	Raw Sewage
3)	Settleable Solids	Primary Effluent
4)	Dissolved Oxygen	Aeration Mixed Liquor
5)	Suspended Solids (PPM)	Aeration Mixed Liquor
6)	Settleable Solids (%)	Aeration Mixed Liquor
7)	Settleable Solids	Final Effluent
8)	Sludge Index (Mohlmann)	
9)	Dissolved Oxygen	Final Sedimentation Tank
10)	Chlorine Residual	Chlorinated Final Effluent

All of these tests are of extreme help to the operator in running the plant. Primarily the mixed liquor suspended solids test, the sludge volume index tests and the aeration tank dissolved oxygen test assist most in maintaining the balance of good organisms and aerobic bacteria essential to the activated sludge process.

Weekly tests are done on the digester. These tests are volatile acids of digested sludge, pH of supernatant, pH of digested and raw sludges.

Twice monthly samples were to be sent to the OWRC Laboratory in Toronto for analysis. During 1963, twenty samples were actually sent to Toronto.


NORTH BAY WATER POLLUTION
CONTROL PLANT
AERATION TANK OPERATION
LBS. BOD PER MONTH X 10,000
LBS. BOD PER 100 LBS. M.L.S.S. X 10
LBS. BOD PER MONTH
LBS. BOD PER 100 LBS. M.L.S.S.
1961
1962
1963
1964
19
BASED ON 31 SAMPLES
BASED ON 51 SAMPLES
BASED ON 20 SAMPLES


NORTH BAY WATER POLLUTION
CONTROL PLANT
AERATION TANK OPERATION
PPM. , CU. FT.
CU. FT. AIR PER LB. BOD REMOVED
M.L.S.S.
1961
1962
1963
1964
19
BASED ON 51 SAMPLES
BASED ON 20 SAMPLES

AERATION SECTION

MONTH	PRIMARY EFFLUENT BOD PPM	*M. L. S. S. PPM	POUNDS BOD PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER POUND BOD REMOVED
JANUARY	77	1956	9	3236
FEBRUARY	95	1125	20	2313
MARCH	85	706	33	1881
APRIL	78	854	37	1132
MAY	59	821	28	1588
JUNE	68	1277	18	1654
JULY	51	1954	8	3458
AUGUST		1643		
SEPT.	28	1113	9	3903
OCTOBER	65	1512	10	2858
NOVEMBER	35	1757	6	4744
DECEMBER	59	1379	12	3001
TOTAL	700	16097	190	29768
AVERAGE	63.7	1341	17.3	2706

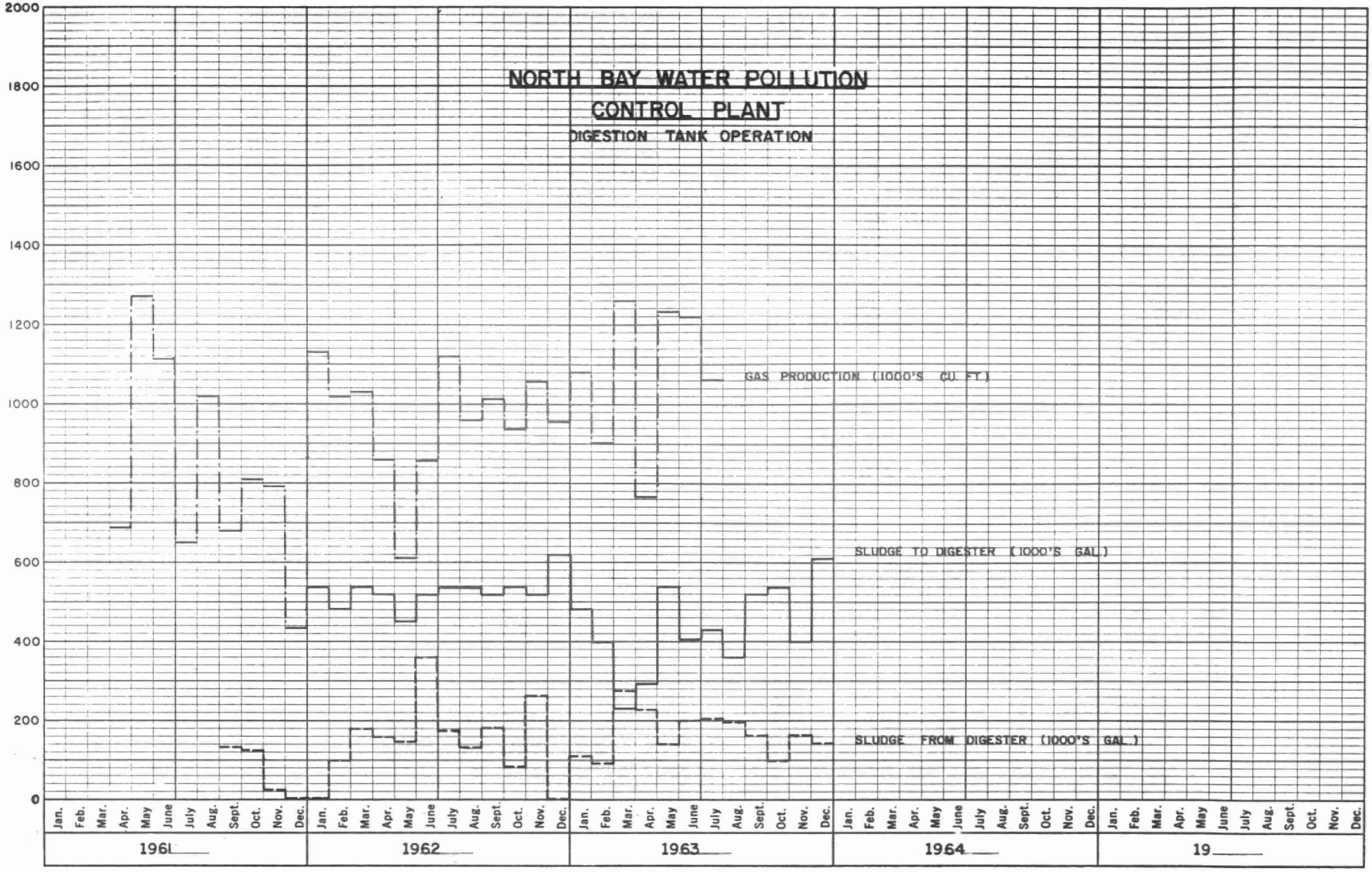
* M. L. S. S. = Mixed Liquor Suspended Solids

COMMENTS

The monthly sample for August was actually taken in early September and therefore averaged with the September results.

The corresponding averages for 1962 were as follows:

Primary Effluent	-	87 PPM
M. L. S. S.	-	1,741 PPM
Lbs. BOD per 100 lbs. M. L. S. S.	-	14.3
Cubic feet of air per pound of BOD removed	-	2,637


NORTH BAY WATER POLLUTION
CONTROL PLANT
DIGESTION TANK OPERATION
GAS PRODUCTION (1000'S CU FT)
SLUDGE TO DIGESTER (1000'S GAL)
SLUDGE FROM DIGESTER (1000'S GAL)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1961
1962
1963
1964
19

DIGESTER OPERATION

MONTH	SLUDGE TO DIGESTER		DIGESTED SLUDGE	GAS PRODUCED	GALLONS SLUDGE
	1000's GALLONS	% TOTAL SOLIDS	% TOTAL SOLIDS	1000's CU. FT.	FROM DIGESTER
JANUARY	486,000	2.45	3.64	1,083,000	107,000
FEBRUARY	396,000	3.11	4.77	901,000	93,000
MARCH	229,000	4.08	2.80	1,262,000	278,000
APRIL	294,000	3.84	3.15	765,000	224,000
MAY	536,000	3.86	4.04	1,232,000	139,000
JUNE	406,000	.65	7.01	1,218,000	199,000
JULY	432,000	2.09	4.81	1,063,000	203,000
AUGUST	363,000			190,000 *	194,000
SEPTEMBER	518,000	.31	1.00		164,000
OCTOBER	536,000	3.67	6.98		96,000
NOVEMBER	397,000	.38	1.18		167,000
DECEMBER	607,000	2.05	5.68		142,000
TOTAL	5,200,000	26.49	45.06	13,224,000 **	2,006,000
AVERAGE	433,333	2.41	4.10	1,102,000	167,168

COMMENTS

* Gas meter out of operation for repairs.
** Prorated on 7 months.

During the year, 5,200,000 gallons of sludge at an average concentration of 2.41% total solids were pumped to the digesters. This is a decrease of about 17.6% from 1962.

The gas production for the year is estimated at 13.2 million cubic feet. This is an increase over the 1962 production of 11,543,610 cubic feet.

In 1962, 1,782,822 gallons of sludge were hauled from the digesters. The sludge hauled in 1963 was greater by 223,178 gallons or approximately 12.5%.

CHLORINATION

MONTH	PLANT FLOW (M. G. D.)	POUNDS CHLORINE	DOSAGE RATE (P. P. M.)
JANUARY	2.626		
FEBRUARY	2.715		
MARCH	3.527		
APRIL	4.230		
MAY	4.336	* 2100	3.5
JUNE	3.634	6050	5.5
JULY	3.501	5980	5.5
AUGUST	3.842	* 7045	5.9
SEPTEMBER	2.883	* 5680	6.6
OCTOBER	2.808		
NOVEMBER	3.150	* 5500	5.8
DECEMBER	3.255	1350	4.6
TOTAL			
AVERAGE	3.377	5650	5.34

COMMENTS

The chlorination period was from May 17th to December 9th. A residual of 0.5 ppm was maintained to reduce the bacteria count in the final effluent. There are no scales at this plant to keep a direct measurement on the pounds of chlorine fed to the chlorinator. The scale on the chlorinator indicates the feed rate in hundreds of pounds per day. The dosage rate is therefore based on an indicated feed rate. The months marked with an asterisk have incomplete records, therefore, the values shown are prorated on the existing records. The chlorinator was out of order for eleven days in August.

1963

PLANT — **Total Operating Costs** — **MONTHLY**

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	3,330.71	2,334.80			423.32		220.81			94.27	257.51
FEB	5,041.95	2,312.95		117.43	730.68	120.95	282.25	182.56	82.25	1,212.88	
MARCH	4,671.80	2,373.96			353.96	51.60	141.65		299.92	889.78	560.93
APRIL	6,319.30	2,429.35		108.55	533.29		159.98		297.24	2,582.54	203.35
MAY	6,759.56	2,145.05	121.56	107.41	738.19		129.50		209.07	3,018.31	290.56
JUNE	4,923.57	2,198.11	202.64		689.19		386.29		369.14	661.88	416.32
JULY	9,653.14	3,423.12	288.10		727.36	3,369.63	244.55	38.37	157.85	916.54	487.62
AUG	3,885.63	2,257.97	202.64		558.53	(1,350.00)	129.19		214.02	1,339.87	533.41
SEPT	5,139.02	2,327.42	202.64		952.92	(450.00)	119.84		341.52	1,048.01	596.67
OCT	3,720.99	2,317.53	162.24		341.09	(900.00)	199.65	60.86	89.66	998.75	451.21
NOV	7,350.92	2,321.19	30.46	77.30	771.05	53.02	249.25	56.84	222.73	2,988.13	580.95
DEC	6,334.38	3,526.95			1,744.84	(874.87)	158.91	52.01	162.73	1,153.30	410.15
TOTAL	67,131.06	29,968.40	1,210.28	410.69	8,564.42	20.33	2,421.87	390.64	2,446.13	16,909.26	4,789.04

SUNDRY INCLUDES TRAVEL, SLUDGE HAULAGE, INSURANCE AND TAXES.

( ) CREDITS

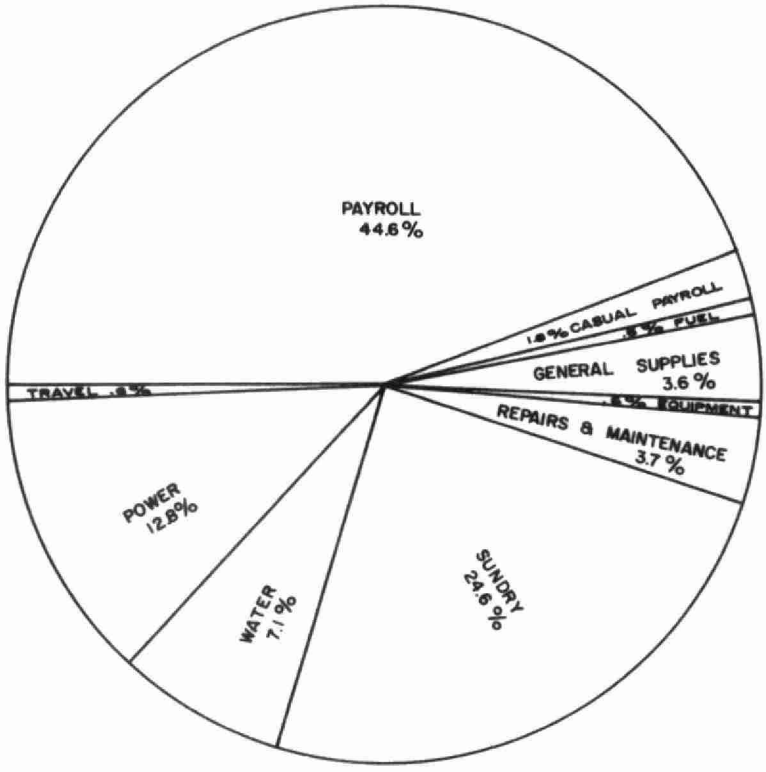
PLANT — **YEARLY**

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER CAPITA PER YEAR *
1961	1,430.000	74,888.15	52.37	1.93
1962	1,118.630	68,332.13	61.09	1.75 **
1963	1,234.303	67,131.06	54.39	1.70

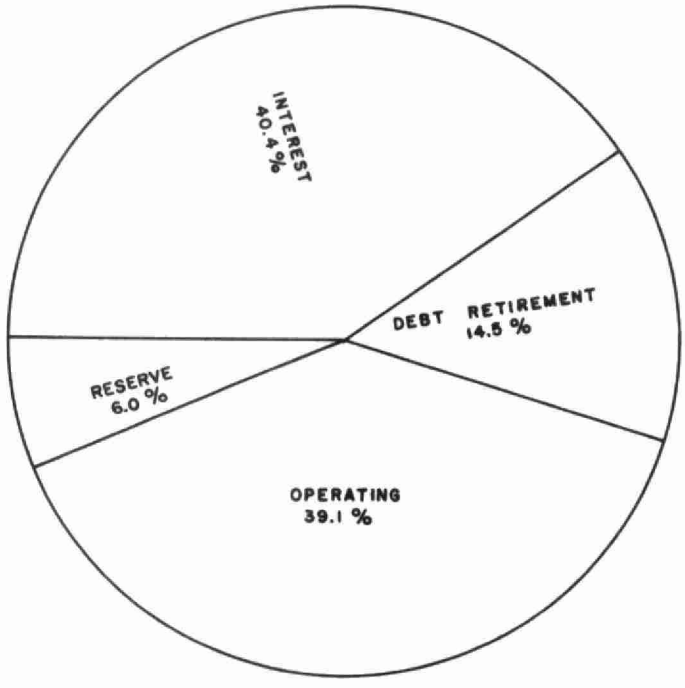
* FOR THE COMBINED MUNICIPALITIES OF NORTH BAY, WIDDIFIELD AND WEST FERRIS.

** APPROXIMATE ONLY.

1963
OPERATING COSTS



TOTAL COSTS



SUMMARY OF OPERATING EXPENSES

ITEM	1961 COST	1962 COST	1963 COST	1963 BUDGET
Payroll	$ 26,394.83	$ 29,943.19	$ 29,968.40	$ 29,400.00
Casual Payroll	5,092.43	1,918.98	1,210.28	1,000.00
Superannuation				1,800.00
Fuel	4,575.05	1,026.82	410.69	1,200.00
Power	12,488.45	9,182.94	8,564.42	10,000.00
Water		5,007.80	4,789.04	5,000.00
Chemicals	3,991.86	3,551.07	20.33	4,000.00
General Supplies	4,029.90	3,209.65	2,421.87	3,500.00
Equipment	1,106.57	1,473.83	390.64	1,600.00
Mtc. & Repair	1,189.48	761.68	2,446.13	1,400.00
Sludge Haulage			9,930.14	6,600.00
Sundry	16,019.52	11,344.32	2,823.26	1,500.00
Ins. & Taxes			3,778.18	4,100.00
Travel			377.68	
Contingency				4,900.00
TOTAL	$ 74,888.15	$ 67,420.28	$ 67,131.06	$ 76,000.00

SUMMARY

The flow to the North Bay Sewage Treatment Plant during 1963 averaged 3.377 million gallons per day (Imperial) as compared to 3.062 MGD in 1962. The flow exceeded the plant design flow of 4.0 MGD 28 percent of the time in 1963 as compared to 12 percent in 1962. This indicates an approach to a time when the plant will be operating at its maximum capacity, expected, if the present trend continues, to occur in two or three years.

The strength of the influent sewage during 1963 was consistent with average sewage, having an average BOD of 164 parts per million and an average suspended solids contents of 229 ppm. The plant efficiency for the year was consistent with design expectations for the activated sludge process, giving reductions of 91.5 percent and 89.0 percent in BOD and suspended solids respectively.

The cost of operating during 1963 was $67,131.06, representing a per capita cost to those persons using the system of $1.70, or a cost of $54.39 per million gallons of sewage treated. This compares favourably with other such plants in the province where the average cost of treatment per million gallons is approximately $95.

RECOMMENDATIONS

The only major undertaking in 1964 is expected to be a complete repainting of the equipment and structures. The plant staff will do the interior work and some of the exterior painting. A casual labourer may be hired to assist in this.

Minor modifications within the plant were proposed. These include changes in piping to reduce the use of potable water and changes in the ventilation to the boiler room to increase boiler efficiency.

Total 1963 Costs

The total cost to the combined North Bay, West Ferris and Widdifield Sewage Treatment Plant during 1963 was:

Operating	$ 67,131.06
Debt Retirement	24,974.65
Reserve	10,247.49
Interest	69,369.93
TOTAL	$171,723.13

On the basis of the population for the combined municipalities totaling 39,489, the cost of the sewage treatment plant was approximately $4.35 per person per year.

Division of Plant Operations

ONTARIO WATER RESOURCES COMMISSION
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